

Abstract of the Invention

System and method for enclosing cells and/or tissue, for purposes of growth, cell differentiation, suppression of cell differentiation, biological processing and/or transplantation of cells and tissues (biological inserts), and for secretion, sensing and monitoring of selected chemical substances and activation of gene expression of biological inserts implanted into a human body. Selected cells and/or tissue are enveloped in a "cage" that is primarily carbon nanotube Bucky paper, with a selected thickness and porosity. Optionally, selected functional groups, proteins and/or peptides are attached to the carbon nanotube cage, or included within the cage, to enhance the growth and/or differentiation of the cells and/or tissue, to select for certain cellular sub-populations, to optimize certain functions of the cells and/or tissue and/or to optimize the passage of chemicals across the cage surface(s). A cage system is also used as an immune shield and to control operation of a nano-device or macroscopic device, located within the cage, to provide or transform a selected chemical and/or a selected signal.